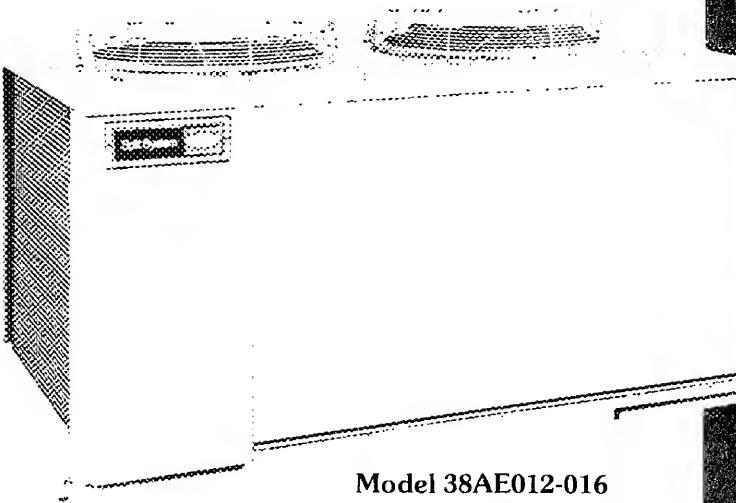
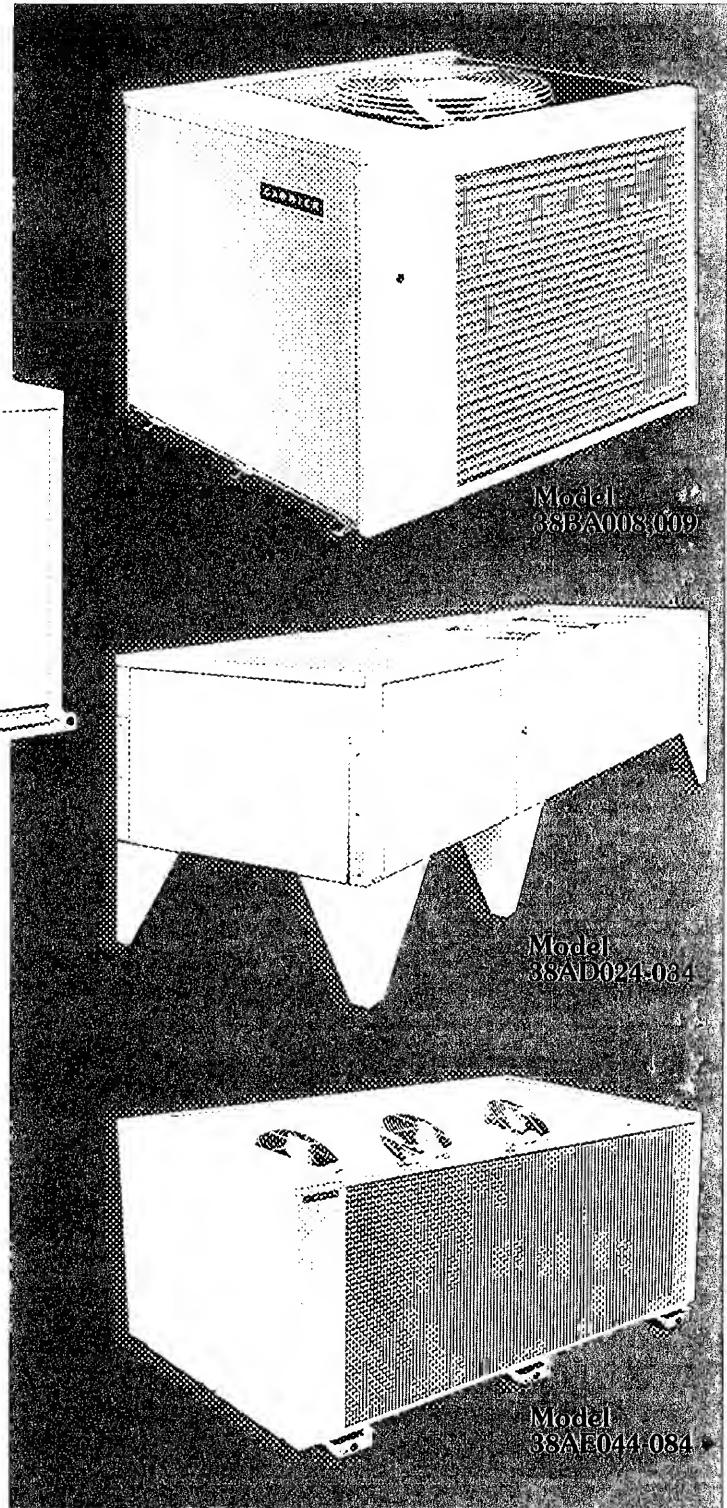


# Carrier Air-Cooled Condensing Units



Model 38AE012-016

38  
Models 38AD,AE,BA  
Capacities 92,000 — 978,000 Btuh



The standout line  
of deluxe products  
for commercial and  
industrial applications

# Carrier split systems expertise helps put an effective lid on runaway operating costs.

Specify Carrier deluxe air-cooled condensing units for those commercial and industrial applications where the operating efficiency and initial low-cost advantages of a split system are needed, along with the performance attributes of a built-up system. Matched with a Carrier packaged air handler or indoor coil section, these reliable condensing units provide cost-efficient cooling at a price that won't break your budget. And in these days of increased attention on the whole concept of energy usage, these units are standout performers. With Energy Efficiency Ratios (EER's) to 9.5!

Choose from 3 basic models, 38AD,AE, and BA, in 12 popular sizes covering the capacity range from 92,000 to 978,000 Btuh. Here are some of the quality features Carrier offers to help you keep the lid on runaway operating costs while at the same time delivering year after year of reliable performance you can count on:

**High-pressure switch** — protects compressor from excessive condensing pressures.

**Low-pressure switch** — provides loss of charge and evaporator freeze-up protection.

**Direct-drive condenser fans** — give quiet, dependable operation; superior sound level control because of advanced fan and venturi design concepts.

**Crankcase heaters** — standard on all models. Helps keep oil in crankcase where it belongs.

**Motor protection** — includes both temperature and current sensitive devices to prevent failure from electrical overload.

**Weather Armor cabinet** — weatherproofed for maximum durability, whether units are mounted on the ground or on the roof.

| The Deluxe Lineup |                        |
|-------------------|------------------------|
| 38BA              | 92,000 - 108,000 Btuh  |
| 38AE              | 119,000 - 182,000 Btuh |
| 38AD              | 252,000 - 371,000 Btuh |
| 38AE              | 480,000 - 978,000 Btuh |

→ **Aluminum fin on copper tube coil construction** — designed for maximum heat transfer and circuited for sub-cooling. Corrosion resistant copper fin/copper tube coils are available.

**Head pressure control** — is built-in thru fan cycling. In 38AD units (three fans), one fan is cycled by an ambient temperature sensor; a second fan is cycled by a head pressure sensor. In 38AE units with 2 or 4 fans, fan cycling is controlled by a head pressure sensor. In 6 fan units, 2 fans are cycled by an ambient temperature sensor, and 2 are cycled by a head pressure sensor.

**Time-delay and part-winding start control** — larger units are equipped with a simple inexpensive means of reducing power demand on start-up and reducing inrush current. On 38AE models with 2 compressors, there is time-delayed start of the second compressor. On Model 38AE084, the second compressor has a time-delay start, with an additional time-delay start for compressor no. 3. On 200/230-volt Models 38AD024-034 and 460-volt Models 38AD028-034, part-winding start control is provided.

**Oil-pressure switch** — takes the compressor off the line 40 seconds after start-up if oil pressure does not rise to switch setting or if pressure is lost. Manual reset on single compressor Models 38AD and on the lead compressor of Models 38AE044-084.

**Solenoid drop relays** — are an integral part of the unit controls on Models 38AD and 38AE044-084 to closely monitor solenoid valve operation. On 38AD models, they also allow single pumpout control to evacuate the low side of the system when the system cycles off. As a safety measure, solenoid closes when the compressor trips off.

# A tough semihermetic compressor is at the heart of 38 Series condensing units. . .

The compressors used in Carrier air-cooled condensing units are built to exacting standards to deliver outstanding efficiency and overall performance.

**Single crankshaft** for motor and compressor ends the need for seals, eliminates costly seal leaks, and the expense of shaft realignment often found with open compressors. Crankshaft is polished in both directions to a micro-inch finish. Assures reliability on start-ups, prevents scoring of bearing surfaces.

**Vane-type oil pump** offers positive oil displacement and is automatically reversible. Needs no breaking in; does not jam.

**Oil-pressure regulating valve** maintains metered oil pressure to the bearings; keeps bearing wear to a minimum.

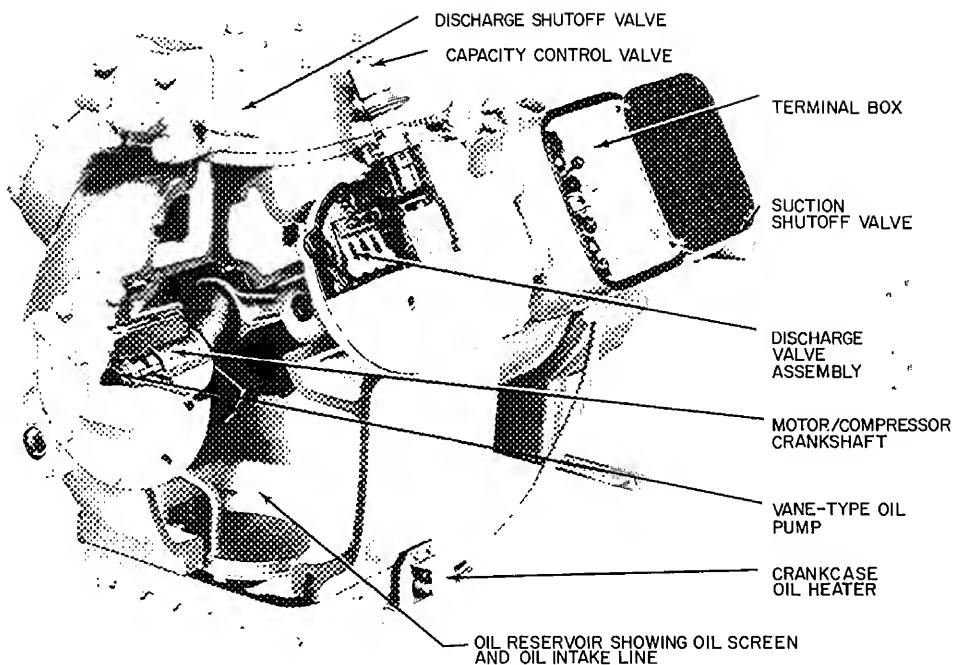
**Class F rated stator windings** enable the motor to withstand higher operating temperatures during locked rotor conditions.

**Automotive-type compression and oil scraper rings** ensure compression and a low rate of oil circulating thru the system, wiping cylinder walls clean of oil, just like in an automobile.

**Swedish steel flapper valves** have been designed to withstand the stress of prolonged operation. Large port areas for suction and discharge valves decrease gas velocity, minimizing pumping losses, increasing overall efficiency, improving the Btuh/watt ratio (EER).

**Pump end bearings** are made from permanent mold aluminum castings. Motor end bearing is steel backed, tin base babbitt type.

**Piston and connecting rod** are composed of a high-density permanent mold aluminum alloy casting, which makes an integral connecting rod bearing.



**Time Guard® circuit** prevents compressor short cycling by requiring a delay of several minutes before compressor can restart after stopping (Models 38AE012-016; 38BA).

Models 38AD024-034, and 38AE044-084 feature a special multifunction Time Guard circuit. This provides approximately a five-minute compressor restart delay, part-winding start of compressors (when offered), bypass of the low-pressure switch at start-up for winter start control, and bypass of the oil-pressure switch at start-up which will shut off the compressor if oil pressure does not reach proper operating level within 40 seconds.

**Capacity control device** is a bypass type that routes discharge gas back into the suction manifold to unload the compressor to partial capacity (Models 38AE012-016).

Models 38AD024-034 and 38AE044-084 have a suction cut-off type that blocks gas from entering the controlled cylinders when the compressor is unloaded.

**Check valve** opens to discharge gas into the manifold during loaded operation and closes to isolate the cylinder bank from the manifold during unloaded operation (Models 38AE012-016).

**Oil level control orifice** or check valve minimizes oil loss from compressor crankcase at start-up. This feature relieves crankcase pressure to the low side and prevents excess oil being pumped out to the high side.

**Crankcase heater** raises oil temperature during off cycle, reducing refrigerant migration which would dilute the oil and allow it to be pumped away at start-up.

# Physical data and dimensions

## PHYSICAL DATA 38AD,AE

| MODEL              | 38AE        |             |             | 38AD        |             |             |  | 38AE        |             |             |             | 38AE        |             |             |             |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| OPER WT (lb)       | 732         | 779         | 789         | 1750        | 1900        | 2300        | 2686   | 3158        | 3682        | 5160        | 5160        | 5160        | 5160        | 5160        | 5160        |
| REFRIGERANT        |             |             |             |             |             |             | R-22   |             |             |             |             |             |             |             |             |
| Oper Chg (lb)*     | 220         | 230         | 230         | 280         | 305         | 355         | 38   | 57          | 81          | 110         |             |             |             |             |             |
| COMPRESSOR         |             |             |             |             |             |             | Reciprocating Hermetic, 60-Hz; 1750 Rpm          |             |             |             |             |             |             |             |             |
| Model(s)           | 06DD<br>824 | 06DD<br>328 | 06DD<br>537 | 06E4<br>250 | 06E5<br>265 | 06E5<br>275 | 06E4<br>250                                      | 06E5<br>275 | 06E4<br>275 | 06E4<br>275 | 06E8<br>275 | 06E8<br>275 | 06E8<br>275 | 06E8<br>275 | 06E8<br>275 |
| Cylinders          | 6           | 6           | 6           | 4           | 6           | 6           | 4  | 6           | 6           | 6           | 4           | 6           | 6           | 4           | 6           |
| Oil (pt)           | 8           | 8           | 8           | 14          | 19          | 19          | 14   | 19          | 19          | 19          | 14          | 19          | 14          | 19          | 19          |
| CONDENSER FANS     |             |             |             |             |             |             | Propeller Type; Direct Drive; Vertical Discharge |             |             |             |             |             |             |             |             |
| Number             | 2           | 2           | 2           | 3           | 3           | 3           | 4  | 6           | 6           | 6           |             |             |             |             |             |
| Rpm; 60-Hz         | 1075        | 1075        | 1075        | 1140        | 1140        | 1140        | 1080   | 1080        | 1080        | 1080        |             |             |             |             |             |
| Air Quantity (cfm) | 8,800       | 8,800       | 8,800       | 18,200      | 25,200      | 28,200      | 26,000   | 39,000      | 39,000      | 39,000      |             |             |             |             |             |
| Watts (Total)      | 1410        | 1410        | 1410        | 3360        | 4050        | 4050        | 2680   | 4020        | 4020        | 4020        |             |             |             |             |             |
| Horsepower         | 1/2         | 1/2         | 1/2         | 1           | 1           | 1           | 1/2  | 1/2         | 1/2         | 1/2         |             |             |             |             |             |
| CONDENSER COIL     |             |             |             |             |             |             |  |             |             |             |             |             |             |             |             |
| Rows.. Fins/in     | 2 15        | 3 15        | 3 15        | 3 11 7      | 3 12 4      | 3 12 4      | 3 15 8   | 2 16 5      | 3 14 6      | 3 14 6      |             |             |             |             |             |
| Face Area (sq ft)  | 29 2        | 29 2        | 29 2        | 35 4        | 39 0        | 49 6        | 76 6   | 114         | 114         | 114         |             |             |             |             |             |
| Storage Cap (lb)†  | 27 2        | 40 0        | 40 0        | 70          | 77          | 99          | 93 7   | 148 3       | 222 8       | 222 8       |             |             |             |             |             |
| DIMENSIONS (ft-in) |             |             |             |             |             |             |  |             |             |             |             |             |             |             |             |
| Length             | A           | 6-4-1/4     | 6-4-1/4     | 6-4-1/4     |             | 12-10-3/4   |  | 11-0-1/4    |             | 12-10-9/16  |             | 13-8-5/32   |             |             |             |
| Width              | B           | 3-8         | 3-8         | 3-8         |             | 3-11-1/2    | 4-10   | 7-0-1/2     |             | 7-0-1/2     |             | 7-0-7/16    |             |             |             |
| Height (Note 2)    | C           | 3-3-7/8     | 3-3-7/8     | 3-3-7/8     |             | 2-4-1/8     | 3-1-7/8  | 4-8-5/32    |             | 5-8-1/8     |             | 7-4-1/8     |             |             |             |
| Leg Height         | D           | 0-2         | 0-2         | 0-2         |             | 1-8         |  | 0-5         |             | 0-5         |             | 0-5         |             |             |             |
| Mounting Holes     |             |             |             |             |             |             |  |             |             |             |             |             |             |             |             |
| Legs               | J           | —           | —           | —           |             | 0-2-1/2     |  |             |             |             |             |             |             |             |             |
|                    | K           | 6-2-1/4     | 6-2-1/4     | 6-2-1/4     | 3-6-1/4     | 3-6-1/4     | 4-4-3/4  | 7-3-5/32    | 7-3-5/32    | 7-3-5/32    |             | 7-3-5/32    |             |             |             |
|                    | L           | —           | —           | —           |             | 3-7-3/8     |  | 5-6-1/2     |             | 8-2         |             | 5-3-3/4     |             |             |             |
|                    | M           | 3-3-1/2     | 3-3-1/2     | 3-3-1/2     |             | 8-10        |  | 3-5-5/8     |             | 2-8-5/16    |             | 5-0         |             |             |             |
| CONNECTIONS (in)   |             |             |             |             | ODM         |             | ODM  | ODF         |             | ODF         |             | ODF         |             |             |             |
| Suction            |             | 1-1/8       | 1-3/8       | 1-3/8       |             |             | 1-5/8  | 2-1/8       |             | 2-5/8       |             | 2-5/8       |             |             |             |
| Liquid             |             | 5/8         | 5/8         | 5/8         |             |             | 7/8  | 7/8         |             | 1-1/8       |             | 1-1/8       |             |             |             |
| Hot Gas Bypass     |             | 3/8         | 3/8         | 3/8         |             |             | 5/8  | 5/8         |             | 5/8         |             | 7/8         |             |             |             |
| OPENINGS (in)      |             |             |             |             |             |             |  |             |             |             |             |             |             |             |             |
| Suction            | E           | 1-3/4       | 1-3/4       | 1-3/4       |             | 2-1/2       |  |             |             |             |             |             |             |             |             |
| Liquid             | F           | 1-1/4       | 1-1/4       | 1-1/4       | 1-3/4       | 1-1/2       | 1-3/4  |             |             |             |             |             |             |             |             |
| Control            | G           | 7/8         | 7/8         | 7/8         |             | 7/8         |  |             |             |             |             |             |             |             |             |
| Power              | H           | 2           | 2           | 2           |             | 3-5/8       |  | 3‡          |             | 3-1/2‡      |             | 4‡          |             |             |             |

\*Approximate charge for maximum system capacity. Holding charge is factory supplied with all units.

†Condenser 80% full of liquid R-22 at 125 F for 012,014,016 units and 120 F for all other units.

‡American Standard straight pipe thread

### NOTES:

1 All multiple-compressor units have interconnected refrigerant piping.

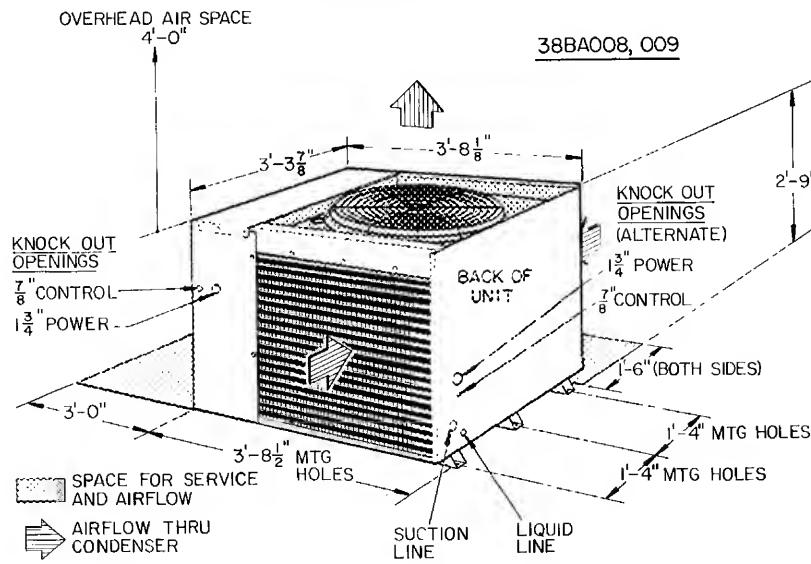
2 Total height for 38AE units; height without legs for all other units.

## PHYSICAL DATA 38BA

| MODEL               | 38BA  |         |
|---------------------|---|---------|
|                     | 008   | 009     |
| OPERATING WT (lb)   | 565   | 595     |
| REFRIGERANT         |   |         |
| Operating Chg (lb)* | 22  |         |
|                     | 14 5  | 16      |
| COMPRESSOR          |   |         |
| Cylinders           | 06DA818                                     | 06DA824 |
| Rpm (60-Hz)         | 4   | 6       |
| Oil Charge (pt)     | 1750  | 1750    |
| 7                   | 10  |         |
| CONDENSER FAN       |   |         |
| Air Discharge       | Propeller Type,<br>Direct Drive<br>Vertical |         |
| Air Quantity (cfm)  | 5000  | 5000    |
| Motor Rpm           | 1075  | 1075    |
| Watts               | 660   | 660     |
| Motor Hp            | 1/2   | 1/2     |
| CONDENSER COILS     | 14 3 Fins per inch                          |         |
| Face Area (sq ft)   | 12 46                                       | 12.46   |
| Rows                | 3   | 3       |
| CONNECTIONS (in.)   |   |         |
| Suction (ODM) Sweat | 1-1/8                                       | 1-1/8   |
| Liquid (ODM) Flare  | 1/2   | 5/8     |

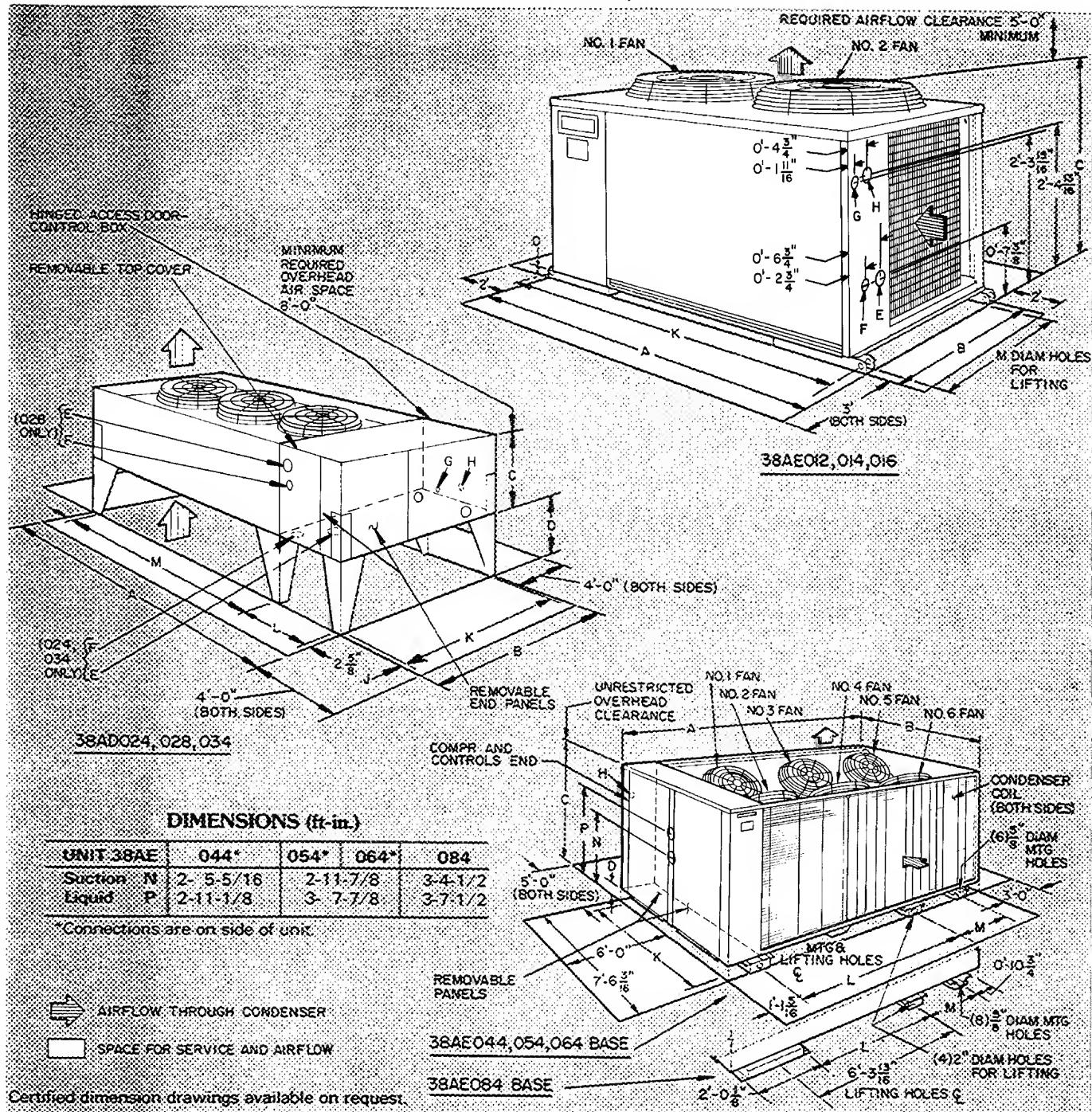
\*Approximate charge for maximum system capacity when using 25 ft of tubing. Units are factory supplied with approximately 2 lb holding charge.

## DIMENSIONS 38BA



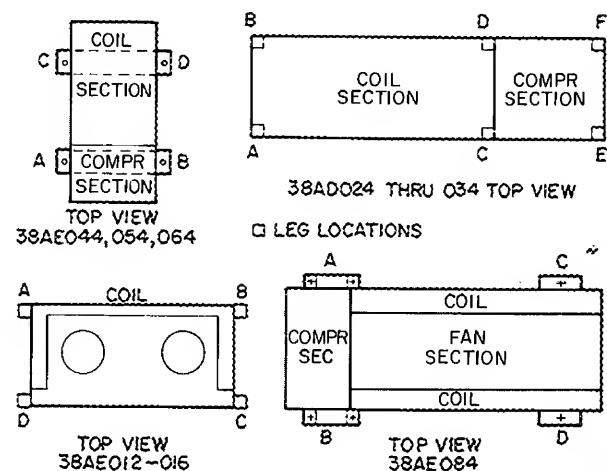
Certified dimension drawings available on request

**DIMENSIONS 38AD,AE**



## WEIGHT DISTRIBUTION

| MODEL<br>38 |     | WEIGHT (lb)    |               |      |     |     |     |     |
|-------------|-----|----------------|---------------|------|-----|-----|-----|-----|
|             |     | Oper<br>Weight | Support Point |      |     |     |     |     |
|             |     |                | A             | B    | C   | D   | E   | F   |
| AE          | 012 | 732            | 142           | 138  | 225 | 227 | —   | —   |
|             | 014 | 779            | 143           | 140  | 247 | 249 | —   | —   |
|             | 016 | 789            | 143           | 143  | 250 | 253 | —   | —   |
| AD          | 024 | 1750           | 175           | 175  | 575 | 575 | 125 | 125 |
|             | 028 | 1900           | 178           | 178  | 521 | 565 | 207 | 251 |
|             | 034 | 2300           | 263           | 263  | 767 | 767 | 120 | 120 |
| AE          | 044 | 2686           | 906           | 906  | 437 | 437 | —   | —   |
|             | 054 | 3158           | 1047          | 1027 | 542 | 542 | —   | —   |
|             | 064 | 3682           | 1174          | 1174 | 667 | 667 | —   | —   |
|             | 084 | 5160           | 1828          | 1828 | 752 | 752 | —   | —   |



# Selection procedure (with example)

I Determine required capacity, saturated suction temperature and temperature of air entering condenser.

Given:

Cooling load ..... 241,000 Btuh  
 Saturated suction temperature  
     at compressor ..... 30 F  
 Temperature air entering condenser ..... 95 F

II Enter Condensing Unit Capacities table at required suction temperature air entering condenser for required capacity. Select a unit that will meet required conditions.

Unit 38AD028 has cooling capacity of 242,000 Btuh at 30 F SST, 118 F SCT and 95 F entering air temperature. Compressor motor power input is 25.4 kw.

## Performance data

### ARI COMBINATION RATINGS

| COND<br>UNIT |     | COIL OR<br>AIR HANDLER | EVAP<br>AIR<br>(Cfm) | NET<br>SYSTEM<br>CAPACITY<br>(Btuh) | EER |
|--------------|-----|------------------------|----------------------|-------------------------------------|-----|
| Model        | SRN |                        |                      |                                     |     |
| 38BA<br>008  | 20  | 28CB008                | 3180                 | 85,000                              | 8.7 |
|              |     | 28LA008                | 3225                 | 86,000                              | 8.9 |
|              |     | 40RR008                | 3300                 | 87,000                              | 9.5 |
|              |     | 40BA009                | 3300                 | 88,000                              | 9.0 |
|              |     | 28CB012                | 3370                 | 90,000                              | 8.9 |
| 38BA<br>009  | 21  | 28CB008                | 3375                 | 98,000                              | 7.9 |
|              |     | 28LA008                | 3375                 | 98,000                              | 7.9 |
|              |     | 40RR008                | 3650                 | 98,000                              | 8.2 |
|              |     | 40BA009                | 3750                 | 100,000                             | 7.6 |
|              |     | 28CB012                | 3860                 | 103,000                             | 7.9 |
|              |     | 28LA012                | 3860                 | 103,000                             | 7.9 |
|              |     | 40RR012                | 3750                 | 100,000                             | 7.7 |
| 38AE<br>012  | 22  | 28LA008                | 3375                 | 104,000                             | 8.1 |
|              |     | 28CB012                | 4000                 | 110,000                             | 8.3 |
|              |     | 28LA012                | 3900                 | 110,000                             | 8.3 |
|              |     | 40RR012                | 4000                 | 119,000                             | 9.0 |
|              |     | 40RR014                | 4500                 | 121,000                             | 9.3 |

EER — Energy Efficiency Ratio (Btuh/Watt)  
 SRN — Sound Rating Number (ARI)

#### NOTES

- 1 Combination ratings are based on evaporators and condensing units at the same elevation and connected by 25 ft of tubing. If other than 25 ft of tubing is used and/or evaporator is installed above condensing unit, a slight capacity variation may occur
- 2 Net capacities shown include a deduction for evaporator fan motor heat
- 3 Direct interpolation is permissible. Do not extrapolate

Rated in accordance with ARI Standards 210-75 and 270-75



### 38BA CONDENSING UNIT CAPACITIES (60-Hz)

| MODEL | SST*<br>(F) | TEMPERATURE AIR ENTERING CONDENSER (F) |     |     |      |     |     |      |     |     |      |     |     |     |     |     |
|-------|-------------|--|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|-----|-----|-----|
|       |             | 85                                     |     |     | 95   |     |     | 100  |     |     | 105  |     |     |     |     |     |
|       |             | Cap.                                   | SCT | Kw  | Cap. | SCT | Kw  | Cap. | SCT | Kw  | Cap. | SCT | Kw  |     |     |     |
| BA    | 008         | 30                                     | 74  | 65  | 69   | 119 | 70  | 66   | 124 | 72  | 64   | 128 | 74  | 58  | 137 | 79  |
|       |             | 35                                     | 82  | 69  | 76   | 122 | 74  | 72   | 126 | 76  | 71   | 130 | 77  | 65  | 139 | 83  |
|       |             | 40                                     | 90  | 74  | 84   | 124 | 77  | 81   | 128 | 80  | 78   | 132 | 82  | 71  | 142 | 89  |
|       |             | 45                                     | 98  | 76  | 92   | 127 | 81  | 88   | 131 | 84  | 85   | 135 | 87  | 78  | 144 | 93  |
|       |             | 50                                     | 107 | 79  | 100  | 129 | 85  | 96   | 134 | 89  | 92   | 138 | 92  | 85  | 147 | 98  |
| BA    | 009         | 30                                     | 88  | 90  | 81   | 125 | 95  | 78   | 129 | 97  | 75   | 133 | 99  | 68  | 142 | 103 |
|       |             | 35                                     | 97  | 96  | 90   | 128 | 101 | 85   | 132 | 104 | 83   | 137 | 106 | 76  | 145 | 111 |
|       |             | 40                                     | 106 | 101 | 99   | 131 | 107 | 95   | 135 | 110 | 91   | 139 | 112 | 84  | 148 | 118 |
|       |             | 45                                     | 116 | 106 | 108  | 133 | 113 | 104  | 137 | 117 | 100  | 142 | 120 | 92  | 151 | 125 |
|       |             | 50                                     | 127 | 113 | 119  | 138 | 121 | 113  | 142 | 124 | 110  | 146 | 127 | 100 | 154 | 132 |

**38AD,AE CONDENSING UNIT CAPACITIES (60-Hz)**

| MODEL<br>38 | SST*<br>(F) | TEMPERATURE AIR ENTERING CONDENSER (F) |     |     |      |     |     |      |     |     |      |     |     |      |     |     |      |
|-------------|-------------|--|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|
|             |             | 85                                     |     |     | 95   |     |     | 100  |     |     | 105  |     |     | 115  |     |     |      |
|             |             | Cap.                                   | SCT | Kw  | Cap. | SCT | Kw  | Cap. | SCT | Kw  | Cap. | SCT | Kw  | Cap. | SCT | Kw  |      |
| AE          | 012         | 20                                     | 75  | 107 | 7.8  | 66  | 115 | 8.3  | 64  | 121 | 8.4  | 61  | 125 | 8.7  | 56  | 135 | 9.0  |
|             |             | 25                                     | 85  | 109 | 8.2  | 77  | 117 | 8.8  | 75  | 122 | 8.9  | 72  | 127 | 9.2  | 65  | 136 | 9.6  |
|             |             | 30                                     | 96  | 111 | 8.7  | 88  | 119 | 9.2  | 85  | 124 | 9.4  | 82  | 129 | 9.8  | 75  | 138 | 10.2 |
|             |             | 35                                     | 107 | 113 | 9.1  | 99  | 121 | 9.7  | 96  | 126 | 10.0 | 92  | 131 | 10.3 | 85  | 140 | 10.8 |
|             |             | 40                                     | 118 | 115 | 9.5  | 110 | 124 | 10.2 | 106 | 128 | 10.5 | 103 | 133 | 10.8 | 95  | 142 | 11.4 |
|             |             | 45                                     | 129 | 117 | 9.9  | 121 | 126 | 10.7 | 117 | 130 | 11.0 | 113 | 135 | 11.4 | 105 | 144 | 12.0 |
| AE          | 014         | 50                                     | 140 | 118 | 10.4 | 132 | 128 | 11.1 | 127 | 132 | 11.5 | 123 | 137 | 11.9 | 114 | 146 | 12.6 |
|             |             | 20                                     | 88  | 105 | 9.2  | 80  | 114 | 9.7  | 76  | 119 | 10.0 | 73  | 124 | 10.3 | 66  | 134 | 10.8 |
|             |             | 25                                     | 102 | 107 | 9.7  | 93  | 116 | 10.3 | 89  | 121 | 10.6 | 86  | 126 | 10.9 | 79  | 136 | 11.5 |
|             |             | 30                                     | 116 | 109 | 10.1 | 107 | 119 | 10.9 | 102 | 123 | 11.2 | 98  | 128 | 11.5 | 91  | 138 | 12.1 |
|             |             | 35                                     | 130 | 111 | 10.6 | 120 | 121 | 11.4 | 116 | 125 | 11.7 | 111 | 130 | 12.1 | 103 | 140 | 12.8 |
|             |             | 40                                     | 144 | 114 | 11.1 | 134 | 123 | 12.0 | 129 | 128 | 12.3 | 124 | 132 | 12.8 | 115 | 142 | 13.5 |
| AE          | 016         | 45                                     | 158 | 116 | 11.6 | 148 | 125 | 12.5 | 142 | 130 | 12.9 | 137 | 134 | 13.4 | 127 | 144 | 14.2 |
|             |             | 50                                     | 172 | 118 | 12.1 | 161 | 127 | 13.1 | 156 | 132 | 13.5 | 150 | 136 | 14.0 | 139 | 146 | 14.9 |
|             |             | 20                                     | 113 | 110 | 12.5 | 103 | 120 | 13.1 | 98  | 124 | 13.5 | 92  | 129 | 13.8 | 83  | 138 | 14.2 |
|             |             | 25                                     | 129 | 113 | 13.4 | 119 | 122 | 14.1 | 114 | 127 | 14.4 | 108 | 132 | 14.8 | 98  | 141 | 15.4 |
|             |             | 30                                     | 146 | 116 | 14.2 | 135 | 125 | 15.1 | 130 | 129 | 15.4 | 124 | 134 | 15.8 | 113 | 143 | 16.4 |
|             |             | 35                                     | 163 | 118 | 15.1 | 151 | 128 | 16.0 | 145 | 132 | 16.4 | 139 | 137 | 16.8 | 128 | 146 | 17.6 |
| AE          | 024         | 40                                     | 179 | 121 | 16.0 | 167 | 130 | 16.9 | 161 | 135 | 17.4 | 155 | 139 | 17.9 | 143 | 148 | 18.7 |
|             |             | 45                                     | 196 | 124 | 16.8 | 183 | 133 | 17.9 | 177 | 137 | 18.4 | 171 | 142 | 18.9 | 158 | 151 | 19.8 |
|             |             | 50                                     | 213 | 126 | 17.7 | 200 | 135 | 18.8 | 193 | 140 | 19.4 | 186 | 145 | 19.9 | 173 | 154 | 20.9 |
|             |             | 20                                     | 168 | 105 | 16.2 | 154 | 114 | 16.9 | 148 | 119 | 17.3 | 142 | 123 | 17.6 | 130 | 132 | 18.2 |
|             |             | 25                                     | 185 | 107 | 17.2 | 171 | 116 | 18.1 | 164 | 121 | 18.5 | 157 | 125 | 18.8 | 144 | 134 | 19.6 |
|             |             | 30                                     | 205 | 109 | 18.3 | 189 | 118 | 19.2 | 182 | 123 | 19.7 | 175 | 127 | 20.1 | 160 | 136 | 20.9 |
| AD          | 028         | 35                                     | 226 | 112 | 19.3 | 209 | 120 | 20.4 | 201 | 125 | 20.9 | 193 | 129 | 21.4 | 178 | 138 | 22.3 |
|             |             | 40                                     | 248 | 114 | 20.4 | 230 | 123 | 21.5 | 222 | 127 | 22.1 | 213 | 131 | 22.7 | 196 | 140 | 23.7 |
|             |             | 45                                     | 271 | 117 | 21.5 | 252 | 125 | 22.7 | 243 | 129 | 23.3 | 234 | 134 | 24.0 | 216 | 142 | 25.1 |
|             |             | 50                                     | 295 | 119 | 22.6 | 275 | 128 | 23.9 | 265 | 132 | 24.6 | 256 | 136 | 25.3 | 236 | 145 | 26.5 |
|             |             | 20                                     | 213 | 105 | 21.6 | 198 | 114 | 22.2 | 190 | 119 | 22.7 | 183 | 123 | 22.9 | 169 | 132 | 23.0 |
|             |             | 25                                     | 236 | 107 | 22.8 | 219 | 116 | 23.2 | 211 | 121 | 24.3 | 203 | 126 | 24.4 | 188 | 134 | 24.7 |
| AD          | 034         | 30                                     | 260 | 109 | 24.3 | 242 | 118 | 25.4 | 233 | 123 | 25.8 | 225 | 127 | 26.0 | 207 | 136 | 26.4 |
|             |             | 35                                     | 285 | 111 | 25.2 | 266 | 120 | 26.9 | 256 | 125 | 27.2 | 247 | 129 | 27.6 | 228 | 138 | 28.1 |
|             |             | 40                                     | 311 | 114 | 26.8 | 290 | 123 | 28.3 | 279 | 127 | 28.7 | 270 | 131 | 29.1 | 249 | 140 | 30.0 |
|             |             | 45                                     | 337 | 116 | 27.8 | 315 | 125 | 29.6 | 304 | 129 | 30.4 | 293 | 134 | 30.9 | 272 | 142 | 31.9 |
|             |             | 50                                     | 363 | 118 | 29.1 | 340 | 127 | 30.7 | 328 | 131 | 31.6 | 318 | 136 | 32.4 | 295 | 144 | 33.9 |
|             |             | 20                                     | 245 | 103 | 24.2 | 225 | 112 | 25.2 | 215 | 117 | 25.8 | 206 | 122 | 26.3 | 188 | 131 | 27.2 |
| AE          | 044         | 25                                     | 271 | 105 | 25.7 | 249 | 114 | 26.9 | 239 | 119 | 27.5 | 229 | 123 | 28.1 | 210 | 132 | 29.2 |
|             |             | 30                                     | 300 | 107 | 27.2 | 277 | 116 | 28.5 | 266 | 120 | 29.2 | 255 | 125 | 29.9 | 233 | 134 | 31.2 |
|             |             | 35                                     | 331 | 109 | 28.7 | 306 | 118 | 30.2 | 294 | 122 | 31.0 | 283 | 127 | 31.8 | 260 | 136 | 33.2 |
|             |             | 40                                     | 364 | 111 | 30.2 | 338 | 120 | 31.9 | 325 | 125 | 32.8 | 312 | 129 | 33.6 | 287 | 138 | 35.3 |
|             |             | 45                                     | 399 | 114 | 31.8 | 371 | 122 | 33.6 | 357 | 127 | 34.5 | 344 | 131 | 35.5 | 317 | 140 | 37.3 |
|             |             | 50                                     | 435 | 116 | 33.3 | 405 | 125 | 35.3 | 390 | 129 | 36.3 | 376 | 133 | 37.3 | 347 | 142 | 39.3 |
| AE          | 054         | 20                                     | 317 | 106 | 33.1 | 291 | 115 | 34.4 | 278 | 120 | 35.0 | 266 | 124 | 35.6 | 241 | 134 | 36.7 |
|             |             | 25                                     | 352 | 108 | 35.0 | 325 | 117 | 36.4 | 312 | 121 | 37.1 | 299 | 126 | 37.8 | 273 | 135 | 39.1 |
|             |             | 30                                     | 390 | 110 | 36.8 | 361 | 119 | 38.5 | 347 | 123 | 39.3 | 333 | 127 | 40.0 | 306 | 137 | 41.6 |
|             |             | 35                                     | 429 | 112 | 38.8 | 399 | 121 | 40.6 | 384 | 125 | 41.5 | 369 | 129 | 42.4 | 340 | 138 | 44.3 |
|             |             | 40                                     | 470 | 115 | 40.8 | 439 | 123 | 42.8 | 423 | 127 | 43.9 | 407 | 132 | 44.9 | 377 | 140 | 47.0 |
|             |             | 45                                     | 514 | 117 | 42.8 | 480 | 125 | 45.1 | 463 | 130 | 46.3 | 447 | 134 | 47.5 | 415 | 142 | 49.9 |
| AE          | 064         | 50                                     | 558 | 120 | 45.0 | 522 | 128 | 47.5 | 505 | 132 | 48.8 | 488 | 136 | 50.2 | 454 | 145 | 53.0 |
|             |             | 20                                     | 393 | 106 | 40.3 | 363 | 116 | 41.7 | 348 | 120 | 42.4 | 334 | 125 | 43.1 | 305 | 135 | 44.4 |
|             |             | 25                                     | 437 | 108 | 42.4 | 405 | 117 | 44.2 | 389 | 122 | 45.0 | 374 | 126 | 45.8 | 344 | 136 | 47.5 |
|             |             | 30                                     | 483 | 110 | 44.7 | 450 | 119 | 46.7 | 433 | 123 | 47.7 | 417 | 128 | 48.7 | 385 | 137 | 50.7 |
|             |             | 35                                     | 533 | 112 | 47.0 | 497 | 121 | 49.3 | 480 | 125 | 50.4 | 462 | 130 | 51.6 | 427 | 139 | 54.0 |
|             |             | 40                                     | 585 | 114 | 49.4 | 547 | 123 | 52.0 | 528 | 127 | 53.3 | 510 | 132 | 54.6 | 472 | 141 | 57.3 |
| AE          | 084         | 45                                     | 640 | 117 | 51.9 | 600 | 125 | 54.8 | 579 | 130 | 56.3 | 559 | 134 | 57.7 | 518 | 143 | 60.8 |
|             |             | 50                                     | 699 | 119 | 54.5 | 654 | 128 | 57.7 | 632 | 132 | 59.3 | 610 | 136 | 60.9 | 565 | 145 | 64.3 |
|             |             | 20                                     | 469 | 105 | 47.0 | 435 | 115 | 48.6 | 418 | 119 | 49.4 | 401 | 124 | 50.1 | 369 | 134 | 51.7 |
|             |             | 25                                     | 520 | 107 | 49.6 | 484 | 116 | 51.5 | 467 | 121 | 52.4 | 450 | 126 | 53.4 | 415 | 135 | 55.3 |
|             |             | 30                                     | 574 | 109 | 52.2 | 537 | 118 | 54.5 | 519 | 123 | 55.6 | 501 | 127 | 56.7 | 464 | 136 | 59.1 |
|             |             | 35                                     | 631 | 111 | 55.0 | 592 | 120 | 57.6 | 573 | 125 | 58.9 | 554 | 129 | 60.2 | 514 | 138 | 63.0 |
| AE          | 084         | 40                                     | 693 | 114 | 57.8 | 651 | 122 | 60.8 | 631 | 127 | 62.3 | 610 | 131 | 63.8 | 566 | 140 | 67.0 |
|             |             | 45                                     | 758 | 116 | 60.8 | 713 | 125 | 64.1 | 691 | 129 | 65.8 | 667 | 133 | 67.5 | 619 | 142 | 71.0 |
|             |             | 50                                     | 827 | 119 | 63.9 | 777 | 127 | 67.6 | 753 | 132 | 69.5 | 727 | 136 | 71.3 | 674 | 144 | 75.1 |
|             |             | 20                                     | 619 | 109 | 64.6 | 571 | 119 | 67.4 | 546 | 125 | 68.9 | 522 | 130 | 70.0 | 476 | 140 | 72.1 |
|             |             | 25                                     | 699 | 110 | 68.1 | 648 | 120 | 71.3 | 621 | 125 | 72.9 | 595 | 130 | 74.3 | 545 | 140 | 76.8 |
|             |             | 30                                     | 778 | 111 | 71.7 | 724 | 121 | 75.2 | 696 | 125 | 76.9 | 668 | 130 | 78.5 | 614 | 140 | 81.5 |
| AE          | 084         | 35                                     | 863 | 114 | 75.7 | 806 | 123 | 79.6 | 777 | 127 | 81.5 | 747 | 132 | 83.2 | 690 | 142 | 86.6 |
|             |             | 40                                     | 948 | 116 | 79.8 | 888 | 125 | 84.0 |     |     |      |     |     |      |     |     |      |

# Electrical data

## ELECTRICAL DATA (60-Hz)

| MODEL<br>38 | Nameplate<br>Voltage | UNIT<br>Voltage<br>Range | UNIT    |       | EACH COMPRESSOR |       | Total<br>Fans | FAN MOTORS |       | Kw  |      |
|-------------|----------------------|--------------------------|---------|-------|-----------------|-------|---------------|------------|-------|-----|------|
|             |                      |                          | MCA     | MOCP* | RLA             | LRA   |               | No. 1      | No. 2 |     |      |
| BA          | 008                  | 208/230                  | 187-253 | 42.7  | 50              | 31.3  | 137           | 1          | 3.6   | —   | 660  |
|             |                      | 460                      | 414-528 | 19.4  | 30              | 14.1  | 62            |            | 1.8   | —   | 660  |
|             |                      | 575                      | 518-660 | 16.4  | 25              | 10.2  | 50            |            | 3.6   | —   | 660  |
|             | 009                  | 208/230                  | 187-253 | 53.1  | 70              | 39.6  | 170           | 1          | 3.6   | —   | 660  |
|             |                      | 460                      | 414-528 | 24.1  | 40              | 17.8  | 77            |            | 1.8   | —   | 660  |
|             |                      | 575                      | 518-660 | 20.9  | 40              | 13.8  | 62            |            | 3.6   | —   | 660  |
| AE          | 012                  | 208/230                  | 187-253 | 62.5  | 100             | 43.6  | 170           | 2          | 4.3   | 3.7 | 1.41 |
|             |                      | 460                      | 414-528 | 29.1  | 40              | 20.0  | 77            |            | 2.3   | 1.9 | 1.41 |
|             |                      | 575                      | 518-660 | 22.8  | 35              | 15.7  | 62            |            | 1.8   | 1.8 | 1.41 |
|             | 014                  | 208/230                  | 187-253 | 69.3  | 100             | 49.3  | 191           | 2          | 4.3   | 3.7 | 1.41 |
|             |                      | 460                      | 414-528 | 31.7  | 50              | 22.1  | 80            |            | 2.3   | 1.9 | 1.41 |
|             |                      | 575                      | 518-660 | 25.6  | 40              | 17.9  | 69            |            | 1.8   | 1.8 | 1.41 |
| AD          | 016                  | 208/230                  | 187-253 | 87.5  | 125             | 63.6  | 266           | 3          | 4.3   | 3.7 | 1.41 |
|             |                      | 460                      | 414-528 | 40.7  | 60              | 29.3  | 120           |            | 2.3   | 1.9 | 1.41 |
|             |                      | 575                      | 518-660 | 33.0  | 50              | 23.8  | 96            |            | 1.8   | 1.8 | 1.41 |
|             | 024                  | 208/230                  | 187-253 | 103   | 175             | 76.0  | 345           | 3          | 4.5   | 4.6 | 3.36 |
|             |                      | 460                      | 414-508 | 51    | 80              | 36.0  | 173           |            | 1.9   | 1.9 | 3.36 |
|             |                      | 575                      | 518-632 | 41    | 60              | 28.6  | 120           |            | 1.6   | 1.6 | 3.36 |
| AE          | 028                  | 208/230                  | 187-253 | 145   | 225             | 100.0 | 446           | 3          | 6.2   | 6.6 | 4.05 |
|             |                      | 460                      | 414-508 | 69    | 110             | 48.0  | 223           |            | 3.0   | 3.0 | 4.05 |
|             |                      | 575                      | 518-632 | 62    | 100             | 43.4  | 164           |            | 2.5   | 2.5 | 4.05 |
|             | 034                  | 208/230                  | 187-253 | 170   | 275             | 120.0 | 506           | 3          | 6.2   | 6.6 | 4.05 |
|             |                      | 460                      | 414-508 | 72    | 110             | 50.0  | 253           |            | 3.0   | 3.0 | 4.05 |
|             |                      | 575                      | 518-632 | 64    | 100             | 45.0  | 176           |            | 2.4   | 2.4 | 4.05 |
| AE          | 044                  | 208/230                  | 187-253 | 187   | 250             | 76.0  | 345           | 4          | 4.6   | 4.6 | 2.68 |
|             |                      | 460                      | 414-508 | 89    | 125             | 36.0  | 173           |            | 2.3   | 2.3 | 2.68 |
|             |                      | 575                      | 518-632 | 74    | 80              | 30.0  | 120           |            | 1.8   | 1.8 | 2.68 |
|             | 054                  | 208/230                  | 187-253 | 241   | 350             | 119.0 | 76.0          | 6          | 4.6   | 4.6 | 4.02 |
|             |                      | 460                      | 414-508 | 111   | 150             | 53.0  | 36.0          |            | 2.3   | 2.3 | 4.02 |
|             |                      | 575                      | 518-632 | 93    | 100             | 45.0  | 30.0          |            | 1.8   | 1.8 | 4.02 |
| AE          | 064                  | 208/230                  | 187-253 | 284   | 400             | 119.0 | 506           | 6          | 4.6   | 4.6 | 4.02 |
|             |                      | 460                      | 414-508 | 128   | 175             | 53.0  | 253           |            | 2.3   | 2.3 | 4.02 |
|             |                      | 575                      | 518-632 | 108   | 125             | 45.0  | 176           |            | 1.8   | 1.8 | 4.02 |
|             | 084                  | 208/230                  | 187-253 | 371   | 450             | 76.0  | 119.0         | 6          | 6.2   | 7.7 | 7.98 |
|             |                      | 460                      | 414-508 | 167   | 200             | 36.0  | 53.0          |            | 3.3   | 3.3 | 7.98 |
|             |                      | 575                      | 518-632 | 141   | 150             | 30.0  | 45.0          |            | 2.6   | 2.6 | 7.98 |

Amp draw at 230 volts. The units have a 575- to 230-volt transformer and use a 230-volt motor

**FLA** — Full Load Amps, for fan motors

**Kw** — Total Kilowatts

**LRA** — Locked Rotor Amps

**MCA** — Minimum Circuit Amps. Complies with National Electrical Code (NEC), Section 430-24

**MOCP** — Maximum Overcurrent Protection

**RLA** — Rated Load Amps, for compressor motors

**Voltage Range** — Units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits. Maximum allowable voltage unbalance between phases is 2%

\*Fuse only

†Only No. 3 and 4 on 38AE044

### NOTES:

1 On 38AE084 units, the center compressor is No. 1, the left is No. 2 and the right is No. 3, viewed from the compressor end of the unit. On all other 38AE units, the left compressor is No. 1 and the right is No. 2, viewed from compressor end.

2 On 38AD units, No. 1 fan is adjacent to the compressor compartment; on 38AE units, No. 1 and 2 fans are in this location.

3 Speed control fan motors for Motormaster® application

38BA008,009 — standard on 200-, 230-, 460-volt units

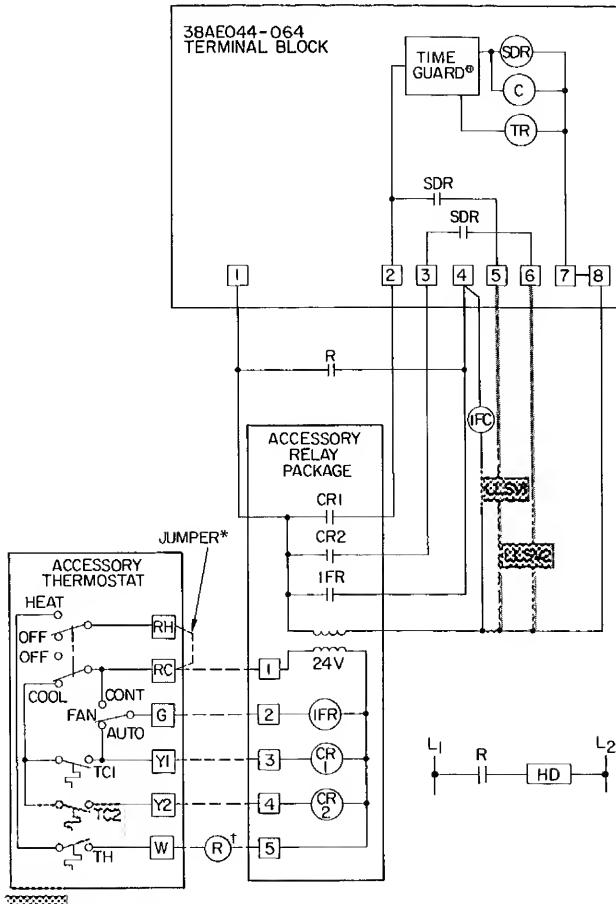
38AE012,014,016 (No. 1 fan) — standard on 208-230-, 460-volt units

All other 38AD (No. 1 fan) — standard on 200-, 230-volt units; special on 460-volt units

All 38AE (No. 1 & 2 fans) — standard on 200-, 230-, 460-volt units

## Accessory control wiring

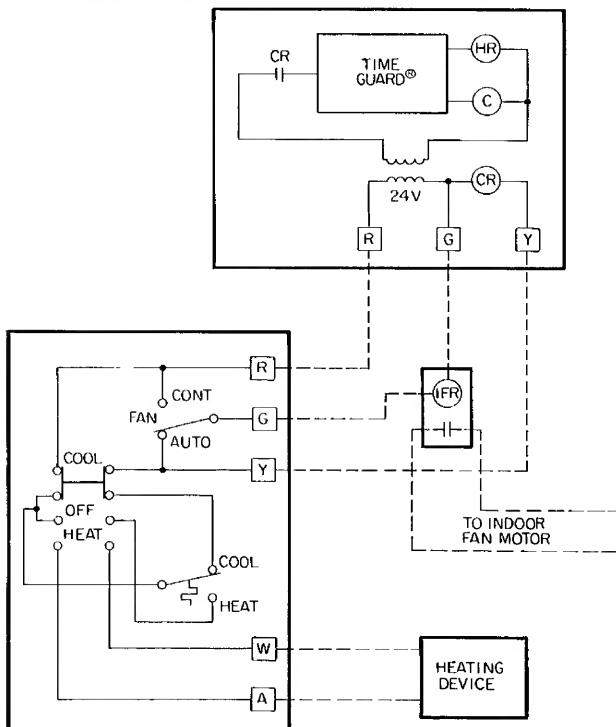
**DEFROST THERMOSTAT, 24-VOLT RELAY PACKAGE  
AND REMOTE CONTROL CENTER FOR  
38AE044-084 UNITS**



- When interconnecting piping is *under* 125 feet:
  - One-step cooling — no LLSV is required
  - Two-step cooling — only LLSV1 is required

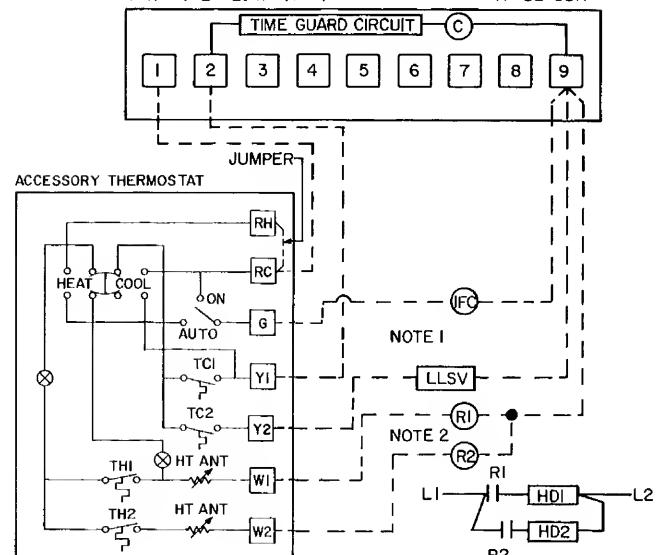
When interconnecting piping is over 125 feet:  
Both LLSV1 and LLSV2 are required  
For one-step cooling, wiring must be changed to  
control both LLSV1 and LLSV2 thru TC1

## ACCESSORY CONTROL WIRING — 38BA008,009



## ACCESSORY THERMOSTAT WIRING, 38AE012-016 UNITS

TERMINAL BLOCK (TB2) IN 38AE012-016 CONTROL BOX

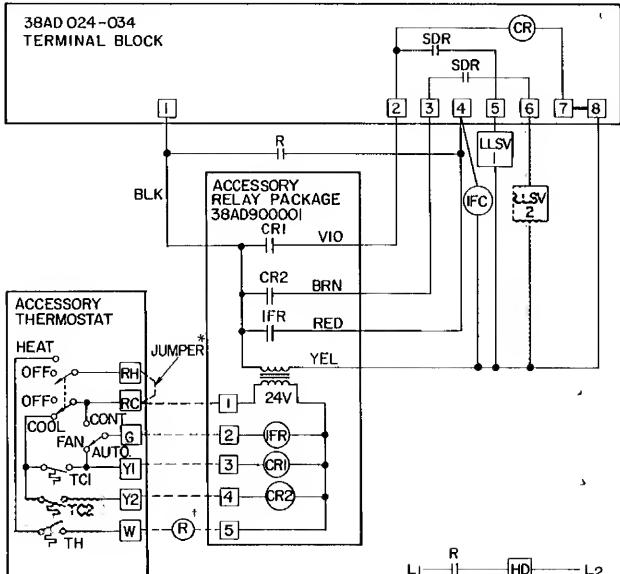


**NOTES:**

1 Combination LLSV plus IFC VA should not exceed 30 VA  
 2 Do not exceed 5 VA (24 VAC) per coil

See accessory list, transformer package 38AE900001 if these VA values must be exceeded

**DEFROST THERMOSTAT, 24-VOLT RELAY PACKAGE  
AND REMOTE CONTROL CENTER FOR 38AD UNITS**



## LEGEND AND NOTES FOR ELECTRICAL DIAGRAMS

|             |  |   |                       |
|-------------|--|---|-----------------------|
| <b>C</b>    | — Compressor Contactor   | <b>SDR</b>  | — Solenoid Drop Relay |
| <b>CR</b>   | — Control Relay  | <b>TC</b>   | — Thermostat, Cooling |
| <b>HD</b>   | — Heating Device   | <b>TH</b>   | — Thermostat, Heating |
| <b>HR</b>   | — Holding Relay  | <b>TR</b>   | — Timer Relay         |
| <b>IFC</b>  | — Indoor Fan Contactor   | <b>Trans</b>  | — Transformer         |
| <b>IFR</b>  | — Indoor Fan Relay   | <hr style="width: 20%; margin-left: 0; border: 0.5px solid black;"/>  |                       |
| <b>LLSV</b> | — Liquid Line Solenoid Valve   | — <b>Factory Wiring</b>   |                       |
| <b>R</b>    | — Heat Control Relay (field-supplied, 24-volt sealed coil, 10-va max rating) | <hr style="width: 20%; margin-left: 0; border: 0.5px dashed black;"/> |                       |
|             |  | — <b>Field Wiring</b>   |                       |

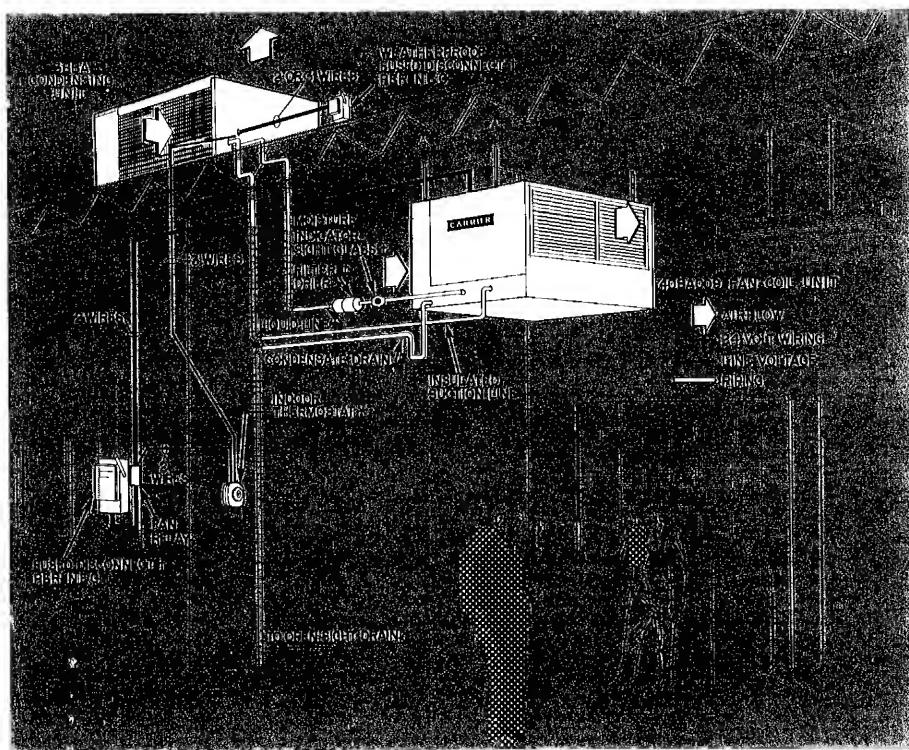
Omit on one-step cooling

\*Jumper removed only when separate 24-volt power sources are available for heating and cooling

†To control heating device and provide automatic indoor fan operation on heating (2-pole, field supplied)

**NOTE: Wiring diagrams are general guides only and are not intended for a specific installation. Refer to individual product Installation, Start-Up, and Wiring literature.**

## Typical piping and wiring

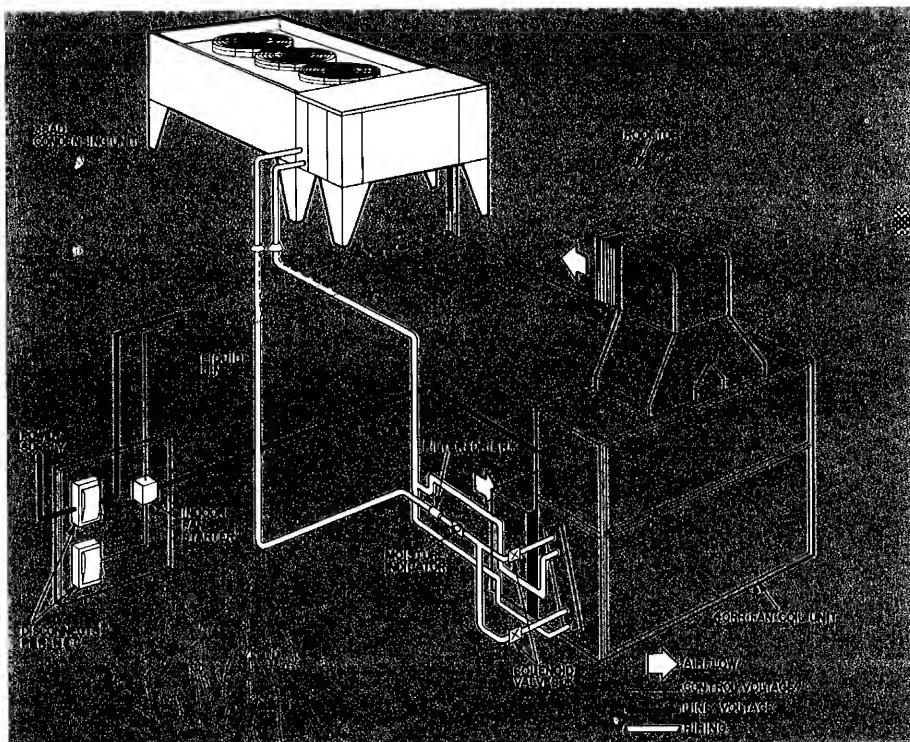


\*Accessory item

†Field supplied

## NOTES

- 1 All piping must follow standard refrigerant piping techniques. Refer to Carrier System Design Manual for details.
- 2 All wiring must comply with the applicable local and national codes.
- 3 Wiring and piping shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.



\*Field supplied

NOTE This illustration is only one example of 38AD/40RR unit connections and not intended to be used as a guideline for system hookups. Refer to the 38AD/40RR Installation Instructions for preferred piping techniques.

## Accessories

- **Electric unloaders**, when coupled with appropriate remote sensors, react quickly to the smallest temperature variation for maximum energy savings.
- **Pressure operated unloader** provides additional step of capacity for Models 38AE012, 38AE014, 38AE016 and 38AE064. Includes cylinder head, valve plate, unloader valve, and hardware.
- **Remote control center and switch base** (24 volt) for thermostatic control of unit from conditioned space. Single-stage, heating-cooling or two-stage heating, single-stage cooling models are available. Allows selection of heating and cooling; allows continuous or cycling operation of indoor fan.
- **Indoor fan relay** controls indoor unit fan motor.
- **Evaporator defrost thermostat package** may be used with winter start control. Contains thermostat, enclosure and necessary wiring and hardware.
- **Low Voltage Relay Package**, a fan relay, support relays, terminal block and enclosure. (Standard in Model 38BA.)
- **The 32LT Motormaster® control** is a solid-state device which measures the saturated condensing temperature of the system and controls the RMS power flow to fan motor. The airflow varies with the fan speed, keeping the condensing temperature and head pressure constant.
- **Gage panel**
- • **Hot gas bypass package** (38AD024-034 and 38AE044-064).
- **Coil grille packages** (38AE012-016 and 38BA008,009).
- **Winter start package** (38AE012-016).
- **Relay transformer package** (38AE012-016).

# Application

## Indoor installations

1. Unit (except Model 38AE044 thru 084) may be installed indoors with ducted condenser air when suitable outdoor location is not available. Condenser fan may be operated against an external static pressure up to 0.2 in. wg. There will be approximately a 1% decrease in capacity at 0.1 in. wg and 3% decrease at 0.2 in. wg.
2. Do not install unit indoors when air entering condenser will exceed 110 F.
3. Standard installation procedures should be followed with regard to ductwork, insulation and vibration isolation. Ducts should be arranged to prevent recirculation of condenser air.

## Use of liquid line solenoid valves

→ 38BA008,009; 38AE012 thru 016: liquid line solenoid valves not required for single evaporator coil applications.

38AE012 thru 016 dual coil applications: single liquid line solenoid required to deactivate upper second-stage coil.

→ 38AD024 thru 034: liquid line solenoid valves required for each evaporator coil stage

38AE044 thru 084 may require liquid line solenoid valves in two types of applications. In installations requiring 125 ft or more of interconnecting piping, solenoid valves are required on all coil splits to be operated by the solenoid drop relay that is installed in the unit. In installations where the compressors are able to unload to a very low percentage of full load, it is usually necessary to install liquid line solenoid valves on one or more of the coil splits to assure sufficient refrigerant velocity in the coil to return oil to the compressor.

The 38AD024 thru 034 units are wired for single pumpout control. Field-supplied liquid line solenoid valve(s) is required to restrict the flow of refrigerant to the evaporator during the off cycle. When the thermostat is satisfied, the liquid line solenoid valve(s) will close. The unit, however, will continue to run, evacuating the low side, until the low pressurestat opens.

The 38BA008,009, 38AE012-016, and 38AE044-064 do not require single pumpout control or a liquid line solenoid drop when the unit is de-energized unless the interconnecting piping exceeds 100 ft (125 ft in the Model 38AE).

Field-supplied liquid line solenoid valves are required on units with multiple evaporators to deactivate upper portion of evaporator coil surface in order to unload compressor (suction-activated unloaders) at part-load conditions and provide single pumpout control when last solenoid drops. *Pumpdown control is not recommended.*

Solenoid drop protection (liquid line solenoid valve closes, compressor shuts off and crankcase heaters energize simultaneously) is recommended for Series 10 cooling applications. Single pumpout is not recommended for Series 10 cooler applications because of possible damage due to frost pinching of cooler tubes.

## Oil return

Condensing units with multiple-step unloading may require double suction risers to assure proper oil return at minimum load operating conditions. Reduction of evaporator coil surface should be analyzed to provide sufficient refrigerant velocity to return oil to the compressor. Liquid line solenoid valves may be used in certain situations to accomplish this. Bypass hot gas, if used, should be introduced before the evaporator. Consult Carrier System Design Manual.

## MINIMUM OUTDOOR AIR OPERATING TEMPERATURE

| MODEL<br>38 | NO.<br>OF<br>CYL | %<br>FULL<br>LOAD<br>CAP. | MINIMUM OUTDOOR<br>OPER TEMP (F)* |          |
|-------------|------------------|---------------------------|-----------------------------------|----------|
|             |                  |                           | DX Evaporator(s)                  |          |
|             |                  |                           | Single                            | Multiple |
| BA          | 008              | 4                         | 100                               | 55       |
|             | 009              | 6                         | 100                               | 50       |
|             | 012              | 6                         | 100                               | 35       |
|             |                  | 4                         | 67                                | 45       |
|             |                  | 2†                        | 33                                | 55       |
|             | 014              | 6                         | 100                               | 37       |
| AE          | 014              | 4                         | 67                                | 48       |
|             |                  | 2†                        | 33                                | 57       |
|             | 016              | 6                         | 100                               | 23       |
|             |                  | 4                         | 67                                | 36       |
|             |                  | 2†                        | 33                                | 50       |
|             | 024              | 4                         | 100                               | 0        |
| AD          | 024              | 2                         | 50                                | 20       |
|             | 028              | 6                         | 100                               | 15       |
|             | and              | 4                         | 67                                | 30       |
|             | 034              | 2                         | 33                                | 45       |
|             | 044              | 8                         | 100                               | 38       |
|             |                  | 6                         | 75                                | 41       |
| AE          | 044              | 4                         | 50                                | 44       |
|             |                  | 2                         | 25                                | 57       |
|             | 054              | 10                        | 100                               | 14       |
|             |                  | 8                         | 80                                | 29       |
|             |                  | 6                         | 60                                | 34       |
|             |                  | 4                         | 40                                | 40       |
| AE          | 064              | 2                         | 20                                | 67       |
|             | 064              | 12                        | 100                               | 14       |
|             |                  | 10                        | 83                                | 17       |
|             |                  | 8†                        | 67                                | 32       |
|             |                  | 6                         | 50                                | 32       |
|             |                  | 4                         | 33                                | 45       |
| AE          | 084              | 2†                        | 17                                | 58       |
|             | 084              | 16                        | 100                               | 14       |
|             |                  | 14                        | 88                                | 15       |
|             |                  | 10                        | 63                                | 33       |
|             |                  | 8                         | 50                                | 32       |
|             |                  | 4                         | 25                                | 46       |

\*With accessory 32 Series Motormaster® head pressure control units can operate to -20 F ambient

†Requires accessory pressure-operated unloader package

## NOTES

- 1 Minimum outdoor air operating temperatures for single DX evaporator based on



On application with multiple DX evaporators, the compressor may be unloaded while an individual coil(s) is still fully loaded. For proper expansion valve operation under this condition, a 90 F condensing temperature must be maintained by observing the minimum ambient under the Multiple DX Evaporator(s) column.

- 2 Winter start operation is standard on 38AD024 thru 034 and 38AE044 thru 084 units and built into the control circuit. The low-pressure switch is automatically bypassed for 2-1/2 minutes on start-up; no liquid line low-pressure switch is required. Field-fabricated wind baffles are required on all 38AE units.
- 3 For winter start operation on 38AE012 thru 016 units, use accessory package 38AE900021.
- 4 For winter start operation on 38BA008 and 009 units, relocate the low pressurestat connection to the connection on the liquid line service valve. Field-fabricated wind baffles are required.
- 5 For evaporator freeze-up protection on 38BA units, add thermostat (Carrier Part 50BB900001) to indoor coil.

# Application (cont)

## LIQUID LINE DATA

| MODEL<br>38 |     | MAX ALLOW<br>LIQUID LIFT (ft)* |
|-------------|-----|--------------------------------|
| BA          | 008 | 60                             |
|             | 009 | 45                             |
| AE          | 012 | 52                             |
|             | 014 | 67                             |
|             | 016 | 82                             |
| AD          | 024 | 84                             |
|             | 028 | 64                             |
|             | 034 | 46                             |
| AE          | 044 | 73                             |
|             | 054 | 38                             |
|             | 064 | 56                             |
|             | 084 | 52                             |

\*Based on a 2 F liquid line loss and a 7 psi pressure loss for accessories

## Guide specifications

**Furnish and install** an air-cooled condensing unit in the location and manner shown on the plan. The unit shall be properly assembled and tested at the factory. It shall be designed for use with Refrigerant 22.

Nominal unit electrical characteristics shall be \_\_\_\_\_ volts, 3-phase, \_\_\_\_\_-Hertz. The unit shall be capable of satisfactory operation within voltage limits of \_\_\_\_\_ volts to \_\_\_\_\_ volts.

**Performance** — Capacity shall be \_\_\_\_\_ Btuh or greater, with air entering condenser at \_\_\_\_\_ F, and a saturated suction temperature at compressor of \_\_\_\_\_ F. Saturated condensing temperature shall not exceed \_\_\_\_\_ F. Maximum liquid lift shall be \_\_\_\_\_ feet.

→ The unit shall operate down to \_\_\_\_\_ F outdoor air temperature entering condenser with standard controls and down to \_\_\_\_\_ F outdoor air temperature with addition of Solid-State Motormaster® Head Pressure Controller.

**Condenser coil** shall be of nonferrous construction. Coil shall have aluminum plate fins, mechanically bonded to seamless copper tubes. Coil shall be circuited for subcooling.

**Condenser fans and motors** — Unit shall be furnished with \_\_\_\_\_ direct-driven, propeller-type fans arranged for vertical discharge. Condenser fan motors shall have inherent protection, and shall be of the permanently lubricated type, resiliently mounted. Each fan shall have a safety guard. Controls shall be included for cycling fan(s) for intermediate season operation.

**Compressor(s)** — Unit shall have \_\_\_\_\_ compressors. Each shall be of serviceable hermetic design with external spring isolators and shall have an automatically reversible oil pump. Maximum power input to compressor shall not

be more than \_\_\_\_\_ kw at conditions specified.

Compressor shall unload in response to suction pressure down to \_\_\_\_\_ % of full capacity in \_\_\_\_\_ steps for partial load operation. Compressor shall be located in a section separated from condenser fans and coil.

Multiple compressor units shall have step-start fans and coils. Compressor motor(s) shall have (part-winding start), (across-the-line start).

**Controls** shall be factory wired and located in a separate enclosure. Safety devices shall consist of high- and low-pressure switches and compressor overload devices. Unit wiring shall incorporate a positive acting timer to prevent short cycling of compressor if power is interrupted. Timer shall prevent compressor from restarting for approximately 5 minutes after shutdown.

The 460- and 575-volt 38BA units shall have a transformer for the 230-volt control circuit. All 38AD and 38AE044-084 units, for all voltages, shall have a transformer for the 115-volt control circuit. The 38AE012-016 units shall have transformer for 24-volt control circuit for all voltages.

**Casing** shall make unit fully weatherproof for outdoor installation. Casing shall be of galvanneal steel, zinc phosphatized and finished with baked enamel.

Openings shall be provided for power and refrigerant connections. Panel shall be removable to provide access for servicing.

**Connections** — Only one liquid line, one suction line and one power supply connection shall be required for each unit.

**Dimensions** of entire assembly shall be not more than \_\_\_\_\_ in. high, \_\_\_\_\_ in. long and \_\_\_\_\_ in. wide.

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Air Conditioning  
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Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

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